

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY
(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference JSony-440PCT	FOR FURTHER ACTION See Form PCT/IPEA/416	
International application No. PCT/JP2003/013316	International filing date (day/month/year) 17 October 2003 (17.10.2003)	Priority date (day/month/year) 18 October 2002 (18.10.2002)
International Patent Classification (IPC) or national classification and IPC B41J 2/05, 2/01, B05C 5/00		
Applicant SONY CORPORATION		

- This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
- This REPORT consists of a total of 4 sheets, including this cover sheet.
- This report is also accompanied by ANNEXES, comprising:
 - ☐ (sent to the applicant and to the International Bureau) a total of _____ sheets, as follows:
 - ☐ sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
 - ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
 - ☐ (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

- This report contains indications relating to the following items:

- | | |
|---|---|
| <input checked="" type="checkbox"/> Box No. I | Basis of the report |
| <input type="checkbox"/> Box No. II | Priority |
| <input type="checkbox"/> Box No. III | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability |
| <input type="checkbox"/> Box No. IV | Lack of unity of invention |
| <input checked="" type="checkbox"/> Box No. V | Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement |
| <input type="checkbox"/> Box No. VI | Certain documents cited |
| <input type="checkbox"/> Box No. VII | Certain defects in the international application |
| <input type="checkbox"/> Box No. VIII | Certain observations on the international application |

Date of submission of the demand 02 March 2004 (02.03.2004)	Date of completion of this report 23 July 2004 (23.07.2004)
Name and mailing address of the IPEA/JP	Authorized officer
Facsimile No.	Telephone No.

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/JP2003/013316

Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

- ☐ This report is based on translations from the original language into the following language _____, which is language of a translation furnished for the purpose of:
- ☐ international search (under Rules 12.3 and 23.1(b))
- ☐ publication of the international application (under Rule 12.4)
- ☐ international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the elements of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

- ☒ The international application as originally filed/furnished
- ☐ the description:
- pages _____, as originally filed/furnished
- pages* _____ received by this Authority on _____
- pages* _____ received by this Authority on _____
- ☐ the claims:
- pages _____, as originally filed/furnished
- pages* _____, as amended (together with any statement) under Article 19
- pages* _____ received by this Authority on _____
- pages* _____ received by this Authority on _____
- ☐ the drawings:
- pages _____, as originally filed/furnished
- pages* _____ received by this Authority on _____
- pages* _____ received by this Authority on _____
- ☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheets/figs _____
- ☐ the sequence listing (*specify*): _____
- ☐ any table(s) related to sequence listing (*specify*): _____

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheets/figs _____
- ☐ the sequence listing (*specify*): _____
- ☐ any table(s) related to sequence listing (*specify*): _____

* If item 4 applies, some or all of those sheets may be marked "superseded."

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**1. Statement**

Novelty (N)	Claims	1-17	YES
	Claims		NO
Inventive step (IS)	Claims		YES
	Claims	1-17	NO
Industrial applicability (IA)	Claims	1-17	YES
	Claims		NO

2. Citations and explanations (Rule 70.7)**Claims 1-17**

Document 1 [JP, 2002-240287, A (Sony Corporation), August 28, 2002 (08.28.02)

Page 1, Paragraphs 0001-0002, 0012, 0013, 0015, 0025, 0026, 0029, 0040 and 0046-0048, All drawings] discloses a thermal ink-jet line printer wherein a plurality of energy generation means (heaters) are disposed in the nozzle arranging direction in a liquid chamber to prevent lines caused by shifts in ink drop hitting position, and providing differences in generated energy causes deflection in ejection direction.

When forming the plurality of heaters, using mask technology to divide a single film into a plurality is merely a matter of design.

Document 2 [JP, 2000-185403, A (Canon Corporation), July 4, 2000 (07.04.00)

Page 1, Paragraphs 0001, 0010, 0014-0016, 0025, 0044, 0045, 0048, 0054, 0072-0074, 0095, 0101, 0105-0108, 0116 and 0126, All drawings] discloses a thermal ink-jet line printer wherein a plurality of energy generation means (heaters) are disposed in the nozzle arranging direction in a liquid chamber to prevent lines caused by shifts in ink drop hitting position, and providing differences in generated energy causes deflection in the ejection direction and a technology for preventing shifts in ink hitting positions caused by changes in distance, by determining the ejection deflection amount in accordance with the distance between the liquid ejecting plane of the head and the ink hitting plane.

Document 3 [JP, 11-048468, A (Matsushita Electric Industrial Co., Ltd.), February 23, 1999

(02.23.99), Page 1, Paragraphs 0009, 0010, 0013 and 0014, All drawings] discloses a thermal ink-jet printer wherein ejection timing so as to correct an ink hitting position in accordance with the distance between the liquid ejecting plane of a head and the ink hitting plane when ink is ejected at an inclination, and calculating the distance by detecting the distance between the liquid ejecting plane of the paper thickness or head and the ink hitting.

Document 4 [JP, 05-238021, A (K.K. Shinko Seisakusho), September 17, 1993 (09.17.93), Paragraphs 0015, 0018 and 0034, Fig. 2] discloses providing a member that maintains a constant distance between the ejection surface and the ink hitting plane by contacting a recording media surface upstream of the head.

Supplemental Box

In case the space in any of the preceding boxes is not sufficient.
Continuation of Box V.2 :

Document 5 [JP, 2000-127553, A (Sanyo Electric Co., Ltd.), May 9, 2000 (05.09.00)
Page 1, Paragraphs 0018, 0029, 0031 and 0032, All drawings] discloses an ink-jet printer that controls so as to cause ink drops to hit an appropriate position in accordance with recording medium surface roughness by measuring a gap (photodetector) between the head and the recording medium at a plurality of printing sections in the direction orthogonal to the recording medium direction.

Document 6 [JP, 08-197738, A (Hitachi, Ltd.), August 6, 1996 (08.06.96)] Paragraphs 0002-0006, 0010 and 0011, All drawings] discloses a photodetector or ultrasonic sensor wherein changes in the recording image size due to distance is prevented by detecting the distance between a liquid ejecting plane of the head and the ink hitting plane and by controlling the ink deflection amount in accordance with the detected value.

Document 7 [JP, 07-081065, A (Toray Industries, Inc.), March 28, 1995 (03.28.95)
Page 1, Claims, Paragraphs 0005, 0011 and 0018-0030, All drawings] discloses a technology wherein, using a laser displacement meter, the distance between the liquid ejecting plane of the head and the ink hitting plane is constantly detected and the ink deflection amount is controlled in accordance with the detected value, thereby preventing printing distortion caused by such distance.

Document 8 [JP, 2000-094784, A (Seiko Epson Corporation), April 4, 2000 (04.04.00)
Paragraphs 0001, 0011, 0014-0016 and 0037, All drawings] discloses a technology for determining the size of the platen gap by receiving attribute information of the recording medium and by referring to a table in place of measuring the recording medium thickness and platen gap.

Document 9 [JP, 08-207322, A (NEC Corporation), August 13, 1996 (08.13.96)
Paragraphs 0001, 0005, 0007 and 0014, All drawings] discloses a line printer having a plurality of detecting means for detecting the paper thickness at positions corresponding to the printing position of each recording element to handle cases where the paper thickness in the line direction varies.

Thus, upon consideration, no special difficulty is found in applying the inventions disclosed in documents 3, 6 and 7 to the invention disclosed in document 1 to constitute an invention such that the ejection deflection amount is controlled in accordance with the distance between the liquid ejecting plane of the head and the ink hitting plane. No special difficulty is found in applying the invention disclosed in documents 8 or the inventions disclosed in documents 5 and 9 to measuring the distance.

Further, no special difficulty is found in applying the invention disclosed in document 8 or the inventions disclosed in documents 5 and 9 to the invention disclosed in document 2.

Therefore, the inventions relating to claims 1-17 could be easily conceived by a party skilled in the art based on the inventions disclosed in documents 1-9.